

STATE OF CALIFORNIA
California Regional Water Quality Control Board
Los Angeles Region
(Underground Storage Tank Program)

General Laboratory Testing Requirements for Petroleum Hydrocarbon Impacted Sites

The purpose of this document is to supplement the Regional Board's Laboratory Report Form (6/00) in order to update obsolete testing requirements and set forth the new requirements for fuel oxygenates and natural attenuation testing. Each analytical method used must be certified by the California Environmental Accreditation Laboratory Program (ELAP).

1. General Laboratory QA/QC Requirements

Conform to the Regional Board's Laboratory Report Form (6/00) in general, except for items specified below.

2. Compounds to be Tested

Total petroleum hydrocarbons in gasoline range (TPHg) (C4 – C12); Total petroleum hydrocarbons in diesel range (TPHd) (C13 – C22); benzene, toluene, ethylbenzene, xylenes (BTEX); methyl tertiary butyl ether (MTBE); di-isopropyl ether (DIPE); ethyl tertiary butyl ether (ETBE); tertiary amyl methyl ether (TAME); tertiary butyl alcohol (TBA). If the gasoline tanks historically or currently contains methanol or ethanol, these compounds are also to be tested.

3. Analytical Test Methods and Detection Limits

Conform to Table 1 below. Report any concentration detected between the method detection limit (MDL) and estimated quantitation limit (EQL) (or reporting limit (RL)) in a numerical value with a "J" flag indicator. All "Non-Detect" (ND) shall be reported in the format with "< (numerical MDL)." Integrate all fuel oxygenate additive concentrations into total petroleum hydrocarbons (TPH) and report it as TPH. EPA Method 8021B may be used to substitute EPA Method 8260B at the sites where all fuel oxygenates have not been identified by EPA Method 8260B in soil and/or groundwater.

Table 1: Analytical Requirements

<u>Analyte</u>	<u>Analytical Method</u>	<u>Required MDL (Method detection limit)</u>	
		<u>Soil (µg/kg)</u>	<u>Water (µg/L)</u>
BTEX	EPA Method 8260B(8021B)	1	0.5
MTBE	EPA Method 8260B	2	1
DIPE	EPA Method 8260B	2	1
ETBE	EPA Method 8260B	2	1
TAME	EPA Method 8260B	2	1
TBA	EPA Method 8260B	20	10
TPHg	Cal-LUFT GC/FID or GC/MS	100-200	50-100
TPHd	Cal-LUFT GC/FID	1000	500
Methanol	Cal-LUFT GC/FID	1000	500
Ethanol	Cal-LUFT GC/FID(EPA8260B)	500	250

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4. Use of EPA Method 5035 for Soil Samples

Apply EPA Method 5035 specified in the USEPA SW-846, version III (12/1996) for soil sample preparation and preservation in order to minimize volatile organic losses. Use the sample collection devices, or equivalent, specified in the method (e.g., the Encore™ sampler). If the Encore™ sampler is used, analyze sample within 48 hours from the collection. Analyze sample within 10 days for soil samples stored under frozen conditions.

5. Natural Attenuation Parameters

Natural attenuation processes include dispersion, dilution, sorption, volatilization, biodegradation, and chemical or biological transformation. A carefully controlled monitoring program for the natural attenuation can be used to confirm site-specific mass reduction and achieve remedial objectives. In order to test parameters to confirm the occurrence of natural attenuation, site characterization must be complete first.

5.1 Primary Natural Attenuation Criteria

Meet the following conditions prior to testing for the secondary natural attenuation parameters:

- Groundwater contaminant plume must be fully defined.
- Groundwater monitoring program on a quarterly basis must be completed for at least two years including data of MTBE and other oxygenates.
- Groundwater concentration has consistently decreased or been stable.
- Determination of site-specific hydraulic conductivity must be conducted: Refer the ASTM D4044-91 for the slug test procedures. Other field methods (e.g., pumping test) are also acceptable to determine hydraulic conductivity.
- Characterization of MTBE and other oxygenates plume vertical extent must be completed with discrete multi-depth groundwater sampling at all groundwater vulnerable areas designated by the Board.

5.2 Secondary Natural Attenuation Parameters

Analyze the secondary natural attenuation parameters only after the primary natural attenuation criteria are met. Analyze the secondary natural attenuation parameters at all groundwater monitoring wells inside and outside of the plume. Conform to Table 2 below for parameters and testing methods.

Table 2: Analytical Requirements for Secondary Natural Attenuation Parameters

<u>Parameters</u>	<u>Test Method</u>	<u>Required MDL</u>
pH	EPA Method 150.2 or Field instrument	n/a
Dissolved oxygen (DO)	EPA Method 360.1 or Field instrument	n/a
Redox potential (ORP)	Field instrument	n/a
Sulfate (SO ₄)	EPA Method 300	5 mg/L
Nitrate (NO ₃)	EPA Method 300	0.1 mg/L
Ferrous iron (Fe ²⁺)	EPA Method 200	0.1 mg/L
Methane (CH ₄)	EPA Method 8015(M)	5 µg/L

6. Electronic Submittal of Data Reporting

All analytical results shall be reported in an electronic format to the State GeoTracker Database.